

Having thus described the preferred embodiments,
the invention is now claimed to be:

1. A method of irradiating fluoropolymer
material comprising:

removing oxygen and oxygen containing gases from
an irradiation chamber;

5 irradiating the irradiation chamber with
penetrating ionizing radiation;

passing fluoropolymer material through the
ionizing radiation in the oxygen and oxygen containing gas
depleted environment of the irradiation chamber.

2. The method as set forth in claim 1 wherein
the irradiating step includes pulsing accelerated
electrons through the irradiation chamber.

3. The method as set forth in claim 1 wherein
the irradiating step includes:

accelerating electrons;

5 directing the accelerated electrons through the
irradiation chamber to break chemical bonds in and
electrically charge the fluoropolymer material.

4. The method as set forth in claim 3 further
including:

5 applying one of magnetic and electromagnetic
fields to cause rotation of the charged fluoropolymer
material in the irradiation chamber.

5. The method as set forth in claim 3 wherein
the removing step includes:

removing air and water vapor from the
irradiation chamber.

6. The method as set forth in claim 1 further
including cooling irradiated polymeric material.

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7. The method as set forth in claim 1 wherein the depleting of oxygen and oxygen containing gases from the irradiation chamber includes:

drawing a vacuum in the irradiation chamber.

8. The method as set forth in claim 7 wherein the vacuum is at least 10^{-1} Torr.

9. The method as set forth in claim 8 wherein the vacuum is at least 10^{-4} Torr.

10. The method as set forth in claim 1 further including:

entraining the fluoropolymer material in gas and passing the gas through the irradiation chamber;

5 after passing the entrained fluoropolymer material through the irradiation chamber, separating the fluoropolymer material from the gas;

recirculating the gas / to entrain more fluoropolymer material.

11. The method as set forth in claim 1 wherein the irradiation chamber is a sealable container and further including:

5 sealing a batch of the fluorocarbon material in the container;

the removing step includes reducing oxygen and oxygen containing gases by drawing a vacuum in the container; and

10 the passing step includes passing the container through the ionizing radiation.

12. The method that is set forth in claim 11, wherein the ionized radiation is a pulsed electron beam.

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a radiation source for generating a beam of
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a vacuum pump for drawing down oxygen and oxygen and oxygen containing gases from the irradiation chamber; and

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a cooler for cooling the material which has been irradiated in the irradiation chamber.

... a particle accelerator which accelerates electrons; and

16. The apparatus as set forth in claim 13 wherein the radiation source is a pulsed electron accelerator.

at least one of magnets and electromagnetic coils disposed adjacent the irradiation chamber for reorienting the fluoropolymer material.

18. The apparatus as set forth in claim 13 further including:

an entraining mechanism for entraining particulate fluoropolymer material into a stream of oxygen depleted gas;

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a pneumatic conduit for conveying entrained fluoropolymer material from the entraining mechanism to the irradiation chamber;

a separator disposed downstream from the irradiation chamber for separating the fluoropolymer material from the entraining gas;

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another pneumatic conduit which conveys gas from the separator back to the entraining mechanism; and

a pump for circulating the gas.

19. The apparatus as set forth in claim 18 further including:

a chiller disposed between the irradiation chamber and the separator.

20. The apparatus as set forth in claim 13 wherein the irradiation chamber with received fluoropolymer material is pumped down to a vacuum of at least 10^{-1} Torr and further including a conveyor for conveying the irradiation chamber through the radiation beam.

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